



HAWAIYA TECHNOLOGIES, LLC

a Small Minority & Veteran Owned Business

**Hawaii Homeland Security
Command Information System
(H2S CIS)**

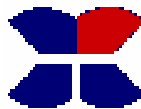
HARDWARE/SOFTWARE DESIGN DOCUMENT (HADD)

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2 H2S CIS System Overview

The Hawaii Homeland Security Command Information System (H2S CIS) is a proof of concept project sponsored by a grant awarded through the Information Technology and Evaluation Program, Office of Domestic Preparedness, Department of Homeland Security. The objective is to develop an integrated Homeland Security Command, Control and Surveillance capability for the State of Hawaii by demonstrating how to capture widely dispersed, disparate sensor data and images generated at a remote site and transmit these data and images via secure Internet or Intranet connection to a Command and Control System located at the Hawaii Civil Defense Emergency Operations Center (EOC) for viewing and appropriate action.

Additionally, advanced concept studies will be performed to determine and identify how developing technology, mission planning capability and operator collaboration tools might be integrated into a future, fully robust Command and Control Surveillance System.

The H2S CIS data will be viewable according to predefined security definitions. During this Concept Demonstration Project, the H2S CIS software will reside on an EOC computer and be accessed via the Hawaii State Intranet only by those users who meet all security provisions.

The H2S CIS team was able to increase and demonstrate capabilities beyond those which were proposed and awarded under the initial proposal. Section 2 defines which capabilities and deliverables are required under the grant award and those which will be demonstrated as the project progresses and under which criteria all will be included. It is important to note that, where these additional capabilities are demonstrated and the effort to develop these was not funded by the grant, the ownership of the hardware and/or software of such will be retained by the party that originated the capability.

3 H2S CIS User Requirements

The Hawaii State Civil Defense has a need to be able to generate, transmit and view, via secure network, remote disparate sensor information. The system must be scalable so as to incorporate additional sensor placement throughout larger geographic areas and expandable to allow for future technologies and capabilities. To achieve this objective, the H2S CIS system must meet the following specific requirements:

- Implementation of a Command Information System at a Command Center located in the State Civil Defense EOC.
- Generation, transmission and receipt of disparate sensor data and images via secure network to the Command Information System
- Integration of surveillance image input from a Critical Infrastructure site
- Provide user training
- Perform an Advanced Concept Study to include:
 - Advanced Sensors
 - Mission Planning System



-
- Operator Collaboration Tools

The deliverables to achieve the user requirements for the H2S CIS system are:

- Command Information System hardware/software
- System sensor (video) input
- On scene wireless video capability
- Critical Infrastructure Surveillance Input capability
- User Training and User Manual
- Advanced Concept Studies

Additional capabilities and functionality that were integrated into H2S CIS include:

- Radar sensor hardware/software including Automatic Identification System (AIS) capability. The radar hardware and Admiral Software will become the property of SCD at the end of the project period. The software that integrates the Radar capability into the H2S CIS system is restricted and shall remain the sole property of Hawaiya Technologies, LLC.
- California Integrated Seismic Network (CISN) data feed which provides accurate and timely data and information products for seismic events throughout the world.

Additional capabilities and functionality that will be demonstrated with the H2S CIS at no cost to the grant include:

- Mobile meshed wireless network w/voice/data/video capability hardware/software. The software/hardware and accessories will not become the property of the SCD at the end of the project period.

4 H2S CIS System Components

H2S CIS will demonstrate four distinct components:

1. The Command and Control System located in the Command Center at Hawaii State Civil Defense EOC.
2. Three (3) disparate sensors (image, radar and AIS) that will provide the data and image feed to the displays at the Command and Control System System.
3. A mobile, meshed wireless network w/voice/data/video capability.
4. Critical Infrastructure Video Surveillance input to the H2S CIS.
5. A link to the CISN system.

Each of these components will be discussed in more detail in the following sections.

4.1 H2S CIS Command and Control System

The H2S CIS Command and Control System is comprised of a customized software application and the supporting hardware configuration that will allow for the collecting and



displaying of pertinent sensor information on the Display Center in the EOC. The customized software will serve as the conduit for the operation of the individual sensor's client software. The hardware will consist of one server, one workstation with monitor, four "stacked" desktop displays and four 50" flat panel displays. The server will function as the data repository for archived sensor data and house the H2S-CIS component software used for documenting and retrieving the data. The workstation will be used primarily for collecting, integrating and viewing the sensor data. Secondly it will serve as the Command and Control System Display Center to manage how the collected data will be presented on the four "stacked" desktop or the four flat panel displays mounted on the wall of the EOC.

4.2 H2S CIS Sensors

For the purpose of capturing data and images to demonstrate the functionality of the H2S CIS, a Nobeltec® Radar antenna and a PELCO® high resolution camera will be installed on the roof of the Public Safety building at Kewalo Basin. This site was recommended by both SCD and DOT because of its strategic position to view Kewalo Basin vessel movement. The data from these sensors will flow through the Hawaii State Next Generation Network (NGN) to the command center at the EOC in Diamond Head Crater. (see Appendix B).

The H2S CIS software will draw upon the output of the existing software applications designed and packaged with each sensor type and will not attempt to replicate the functionality of that existing software. H2S CIS will achieve this by allowing for the uploading of data and images from the sensors to the resident server and then fusing and integrating the data into display interfaces to the watch commander workstation located in the EOC for status, review and appropriate action.

There will be automatic alerting incorporated into the system based on selected criteria such as target (vessel) movement into specific areas and target behavior.

4.3 The Mobile Meshed Wireless Network

This system allows rapid deployment of high bandwidth applications such as streaming video, IP telephony, Internet access, and environmental sensing and monitoring over a meshed, mobile wireless network with reachback through the Internet/Intranet to the H2S CIS display center. It is portable and self-powered and can be used wherever spontaneous deployment of networks is required to support situation awareness and maintain connectivity to other sites. The system can act as a secondary communication infrastructure where existing telecom networks have been disrupted or do not exist. The demonstration of this technology with the H2S CIS exceeds the original deliverable for an On Scene Photo Documentation Kit (OSPDK) capability.



4.4 Critical Infrastructure Video Surveillance Feed

H2S CIS will demonstrate that the video images from a critical infrastructure surveillance system (Hawaii Electric Company) can be, under specific criteria and with incident granted access, be fed back to the Command and Control System Display Center for viewing by SCD personnel.

5 H2S CIS Architectural Design Overview

5.1 H2S CIS Functional Architecture

H2S CIS will utilize the state's high speed Next Generation Network (NGN) to collect sensor data and transport that data to the command center located at the EOC. Once collected the integration, display and optional archiving of the data will be controlled via the H2S-CIS system.

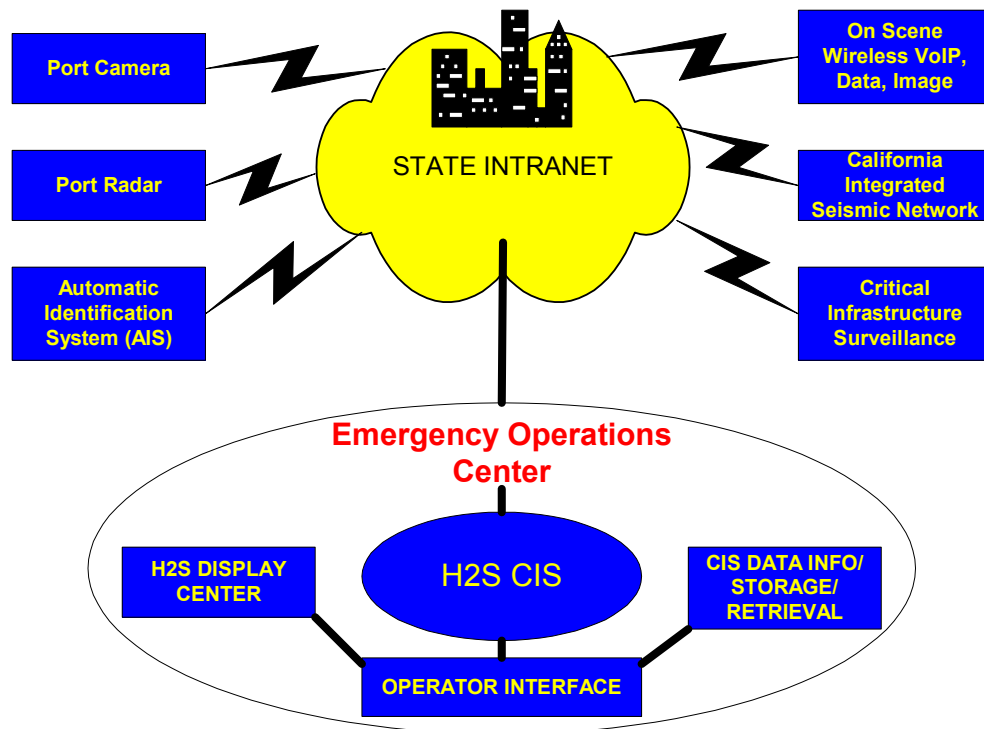


Figure 1 H2S CIS Functional Architecture



5.2 H2S CIS System Architecture

The H2S CIS system will be comprised of a radar sensor, video sensor, on-sight documentation sensor and critical infrastructure sensors. The system will also include an Ad Hoc Wireless LAN system to act as the transport for the incident on-sight sensors. Control of the sensors and the processing of the data they generate will originate from the command center. Each sensor will act as a separate node within the system, the functioning of any individual sensor is independent of any other sensor.

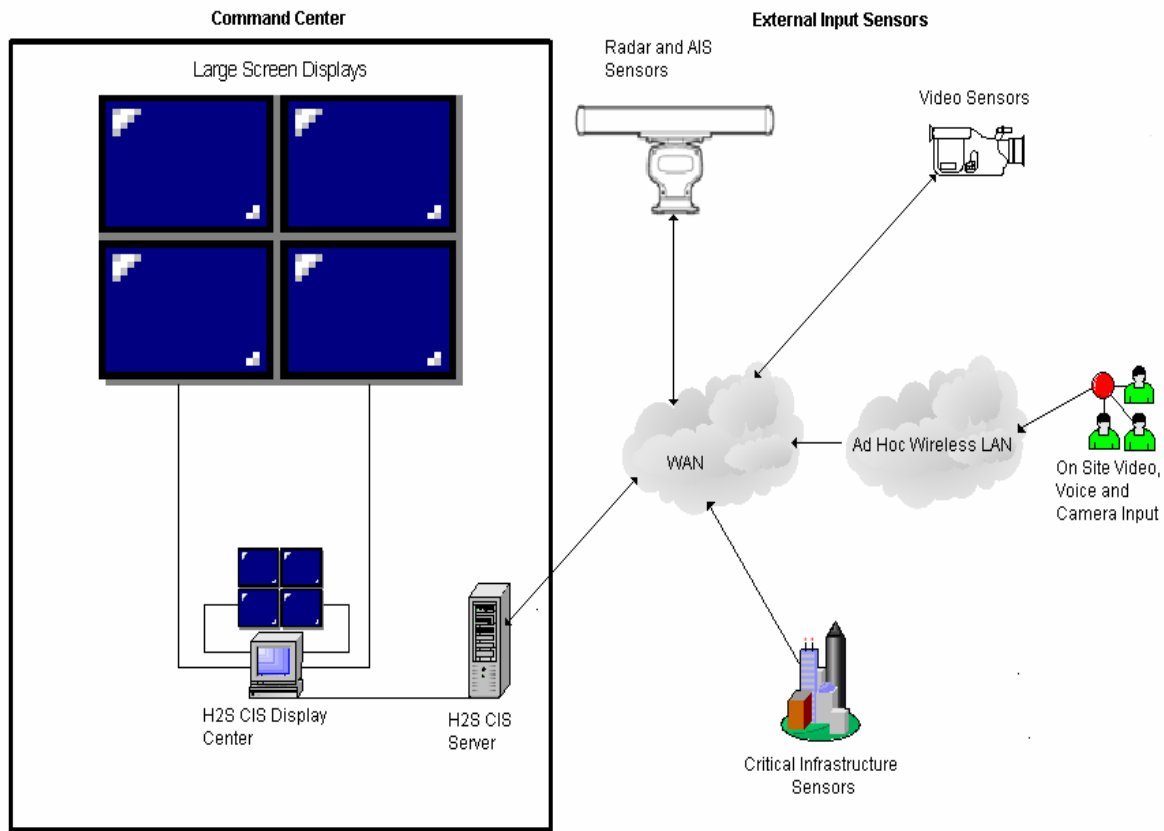


Figure 2 H2S CIS System Architecture



5.3 H2S CIS Data Architecture

It is a SCD security requirement that wherever possible the sensor data and images be transported over the State intranet topography. Subsequently, the H2S CIS archived data will only be accessible to State Intranet users with appropriate privileges. A VPN will be utilized to enable users access to the H2S CIS client software for the purpose of viewing non-archived data in the command center. All access will be in accordance with the H2S CIS security model (see Appendix B).

As data flows from the sensors into the command center, the H2S CIS system software will supply the operator with the appropriate application required to process it. In the case of the Nobeltec radar it will be the Nobeltec Admiral Software, for the PELCO camera it will be the DVR's client software. The incident on-sight sensors and critical infrastructure sensors data will be handled by software appropriate to the type of data being transmitted. This may require 3rd party client software or be accomplished with simple file transfers and then processed by the H2S CIS software directly. Regardless of how the data is initially processed, it will be displayed and archived through the H2S CIS client software. Archived data will be stored on the H2S CIS server and retrieved via the H2S CIS component software.

H2S CIS' software architecture has been developed using a "three-tiered" architecture. This design is renowned for its stability and advantage because each of the three tiers performs a specific role, thereby simplifying development and allowing upgrades and maintenance to be performed with minimal disruption to the overall system. The Presentation Layer renders content in a form appropriate for the system's end user. In H2S CIS, this is achieved via Hypertext Markup Language – a de facto standard format for web content that is supported by numerous software applications. The Business Layer, which embodies a system's logic and enforces its rules and semantics, is built on Microsoft's™ Active Server Pages™ (ASP) technology combined with ActiveX™ Dynamic Link Libraries developed (in Visual Basic 6.0™) specifically for use in H2S CIS. As a server-side technology, ASP is capable of accessing various data sources, which eliminates the need for client side application deployment. ActiveX™ DLLs are essentially "mini-programs" or "modules" and offer a fast and efficient means of encapsulating functionality and implementing version control. For the Persistence Layer, which is responsible for supplying requests for data with an appropriate response, H2S CIS uses a relational database.

In overview, the browser component of H2S CIS works by allowing users to post files from their client computers or request files from the server via the H2S CSCS client component. ASP scripts handle the incoming requests and, in turn, make requests of their own to the database. For resource intensive or transactional operations, these requests are made using ActiveX DLLs. The database, which tracks metadata pertaining to posted files and other information, then responds with the information required for the ASP script to process a response. Depending on the nature of the request, the response is either a binary



(file) stream or an HTML stream, which is returned to the requesting browser for client-side rendering. A schematic of this general process is depicted in the following diagram.

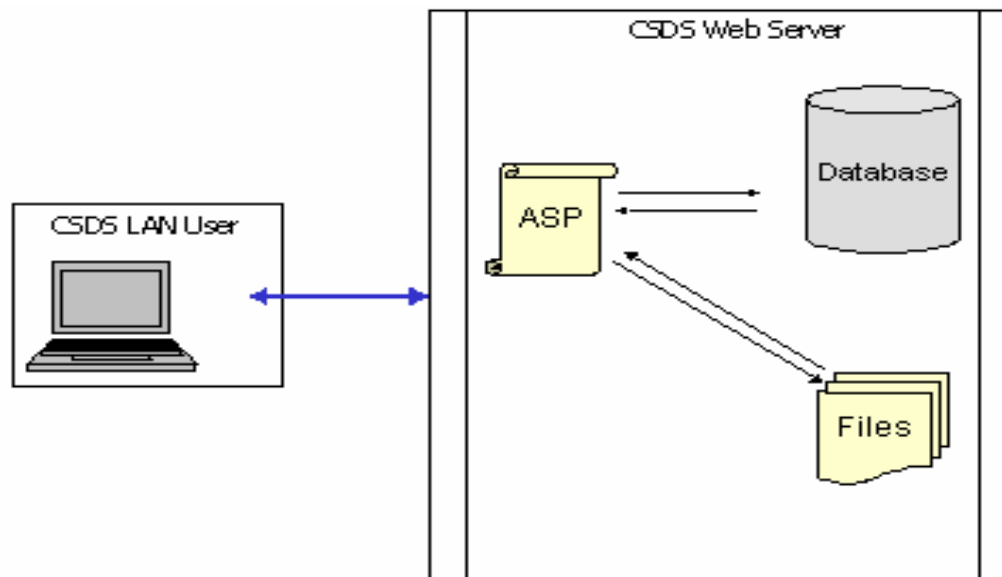


Figure 3 H2S CIS Data Architectural Schematic

Although H2S CIS is being developed only as a demonstration system, efforts have been taken to make it as scalable and extensible as possible. With this in mind, there are certain technical considerations that warrant mention.

First, HTML (despite being a standardized language per the World Wide Web Consortium www.w3c.org as HTML 4.0) is not prevented from being interpreted differently by third-party web browser applications. Because “cross-browser” development is a time consuming and expensive effort, H2S CIS has only been required to provide HTML in a format that is compatible with the Microsoft’s Internet Explorer™ 5.0 (or greater) browser. Other popular browsers such as Netscape Navigator™ and AOL™ may be able to view H2S CIS but are not specifically supported.

Secondly, ASP scripts can be written in either Visual Basic Script or Java Script. Both scripting languages are essentially reduced-functionality versions of their respective namesakes. ASP is an interpreted language, whereas Visual Basic is compiled. In the simplest of terms, altering ASP code is easier than altering Visual Basic code but Visual Basic code is far more safe and efficient than ASP code. Therefore H2S CIS is developed using ASP code exclusively for design purposes but is deployed as ASP code with its logic hosted in embedded ActiveX DLLs.

6 H2S CIS System Configuration and Specifications

This section addresses the configuration and specifications of the computer hardware,



sensors and software that comprise the H2S CIS.

6.1 CIS Command and Control System Display Center Configuration

The H2S CIS Command and Control System is comprised of a customized hardware configuration that will allow the generating and posting of pertinent sensor information for display in the EOC. The workstation will be used primarily for collecting and viewing the sensor data. Secondly it will serve as the Command and Control System center to control how the collected data will be presented either on the four “stacked” desktop monitors or onto the large screen 4-panel display mounted on the wall of the EOC.

The H2S CIS Display Center will be used for fusing sensor data and, in certain circumstances, critical infrastructure video surveillance input to the displays located in the center. The Display Center will be configured so users with appropriate permission can access the images and data via terminal services over the State Intranet. The following diagram shows the schematic organization of the Command and Control System Display Center.

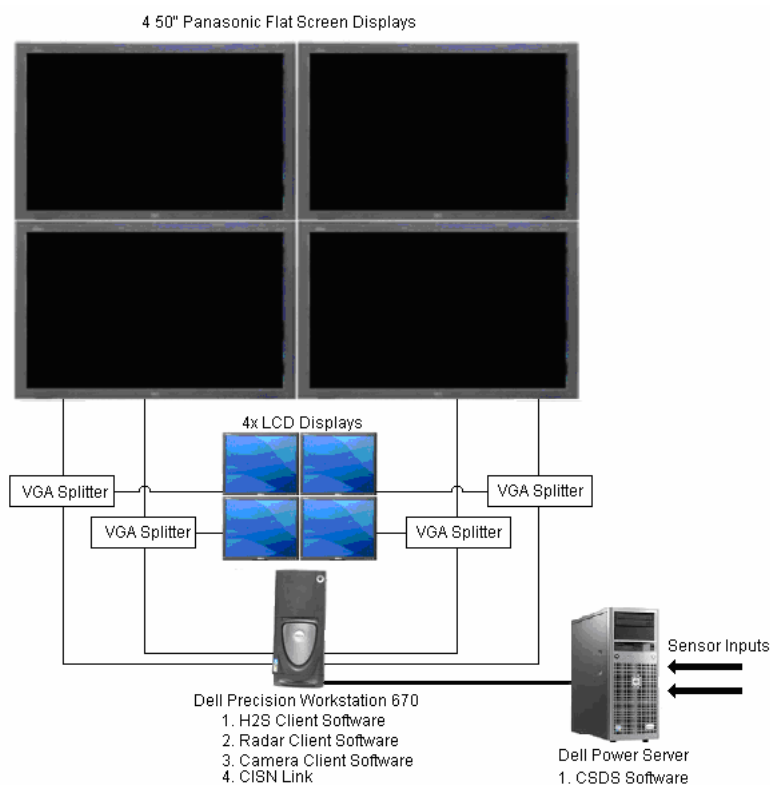


Figure 4 H2S CIS Command Information Display System



6.1.1 H2S CIS Server Specifications

Dell PowerEdge 2650 Rack Mount Server

- Intel Xeon, 2.4 GHz, 512K Cache, 533MHz Front Side Bus
- GB DDR, 266 MHz, 2x512 DIMMS Memory
- (2) 73 GB 10K rpm ULTRA 320 SCSI Hard Drives connected to RAID card
- PERC3-QC, 128MB, I Internal, 3 External Channels Controller
- 1.44 Diskette Drive
- Dual On-Board NICS
- 24X IDE Internal CD ROM Drive
- Active Bezel Option for Dell PowerEdge 2650
- 5 Bay (1X5) Hot Plug SCSI Hard Drive Backplane
- Non-Redundant AC 500 Watt Power Supply
- Adaptec 2410SA Enclosure Kit for USB Device
- Dell E773 17" Monitor
- Standard Windows Keyboard
- Tapeware Software, SBS/Enhanced Suite
- 3 YR Silver Support, 4 Hour Onsite, S/W Support

6.1.2 H2S CIS Command and Control Workstation Configuration

The H2S CIS Command and Control System will consist of the following key components:

1. One (1) H2S CIS Workstation w/monitor
2. One (1) Quad-panel Flat Screen Display
3. Matrox G450 MMS Graphics Card (4 output video ports; 1920 x 1200 max pixel resolution per port; 1 NTSC/PAL/SECAM video input port; utility software that includes the ability to capture input video)
4. Four (4) VGA/SVGA Cables (Belkin Pro Series High Integrity 25' cables for Group SF and standard 6' cables for MSO SFB)
5. Installed Applications: Microsoft Office 2000 Professional, Camera, Radar and CI licensed software.

This system will be configured so that the 17-inch monitor will be the primary monitor and the 4-panel display monitors will be secondary. The primary monitor will be used to build the sensor input displays and control the information displayed on the 4-panel display. The Mass Multiples 4-panel display monitors will comprise the separate sensor and CI input displays and will be arranged in a 2 by 2 matrix. The Matrox graphics card will drive the video display to the Mass Multiples 4-panel display and will provide for viewing and capturing of standard video input. The user interface will include minor customization for H2S CIS operator tasks.



6.1.2.1 H2S CIS Command and Control System Workstation Specifications

Dell Precision Workstation 670

- Intel® Xeon™ Processor 3.00GHz, 1MB L2 Cache
- 2GB, DDR2 SDRAM Memory, 400MHz, ECC (2 DIMMS)
- Entry Level, PS/2, No Hot Keys
- Dell 17" UltraSharp 1704 FPT Flat Panel, adjustable stand, VGA/DVI
- 128MB PCIe X16 ATI FireGL V3100, Dual VGA or DVI+VGA capable
- (2) 160 GB SATA, 7200 RPM Hard Drive with DataBurst Cache™
- C1- All SATA drives, Non-RAID, 1 to 2 drive total configuration
- 3.5 inch 1.44MB Floppy Drive
- Dell USB 2-Button Optical Mouse with Scroll
- NTFS File System
- 16X DVD+/-RW w/Sonic RecordNow! Delux plus, CyberLink Powerlink DVD
- Microsoft Office Professional Edition 2003 and Adobe Acrobat 6.0
- Internal Chassis Speaker
- 3 Year Standard Support

6.1.3 H2S CIS Peripherals

H2S CIS requires two sets of supporting display peripherals – four (4) 15" monitors and four (4) 50" screens in. The following are the particular makes and models that have been selected:

1. One (1) Quad (four screens) 15" Color LCD Flat Panels Display (15" diagonal Active Matrix; 1280 x 1024 max pixel resolution per display; and stand mounted display.
2. Four (4) Panasonic 50" Plasma Flat Panel Displays.



6.1.3.1 Panasonic TH-50PHD7UY 50" Display Specifications

GENERAL

Product type	Plasma panel - Color
Technology	Plasma (PDP)
Diagonal size	50 in
Image aspect ratio	16:9
HDTV compatible	Yes
Width	47.6 in
Depth	3.7 in
Height	28.5 in
Weight	94.8 lbs

VIDEO SYSTEM

Resolution	1366 x 768
Image contrast ratio	3000:1
Total Pixels	1,049,088
Viewing angle	160 degrees

AUDIO SYSTEM

Audio system sound output mode	Stereo
External speakers amplifier power	16 Watt

TELEVISION FEATURES

Additional features Screen saver, Real MACH system, Video noise reduction, Picture-in-picture (PIP), 3:2 pulldown compensation

REMOTE CONTROL

Remote control	Remote control (Infrared)
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CONNECTIONS / CABLES / SLOTS

Input/Output connections 1 x VGA input (15 pin HD D-Sub (HD-15)) - Rear, 1 x Serial (9 pin D-Sub) - Rear, 1 x S-Video input (4 pin mini-DIN) - Rear, 1 x Composite video input (BNC) - Rear, 1 x Composite video output (BNC) - Rear, 1 x HD component video / RGB input (BNC x 3) - Rear, 1 x Audio line-in (Mini-phone stereo 3.5 mm) - Rear, 2 x Audio line-in (RCA phono x 2) - Rear, 2 x Speakers output - Rear

INTEGRATED DEVICE(S)

DVD player type	None
VCR type	None
Radio tuner bands	None

POWER

Power device	Power supply Internal
Voltage required	50/60 Hz
Power consumption operational	480 Watts



6.2 H2S CIS Sensors Configuration and Specifications

For the purpose of capturing data and images to demonstrate the functionality of the H2S CIS, a Nobeltec® Radar antenna and a PELCO® high resolution camera will be temporarily installed on the roof of the Public Safety building at Kewalo Basin. This site was recommended by both SCD and DOT because of its strategic position to view Kewalo Basin vessel movement. The installation of the two sensor types will be achieved by mounting them on a weighted tripod located on the upper most level of the roof of the building.

The data from these sensors will flow through devices installed in a secured storage closet in the fifth floor conference room and then via Ethernet connection to the fourth floor server room where it will be transmitted via the Hawaii State Next Generation Network (NGN) to the command center at the EOC in Diamond Head Crater. The devices in the closet include a network switch, AIS receiver, DVR to store the camera images, the radar data converter and (2) two 24 volt a/c and d/c power supplies.

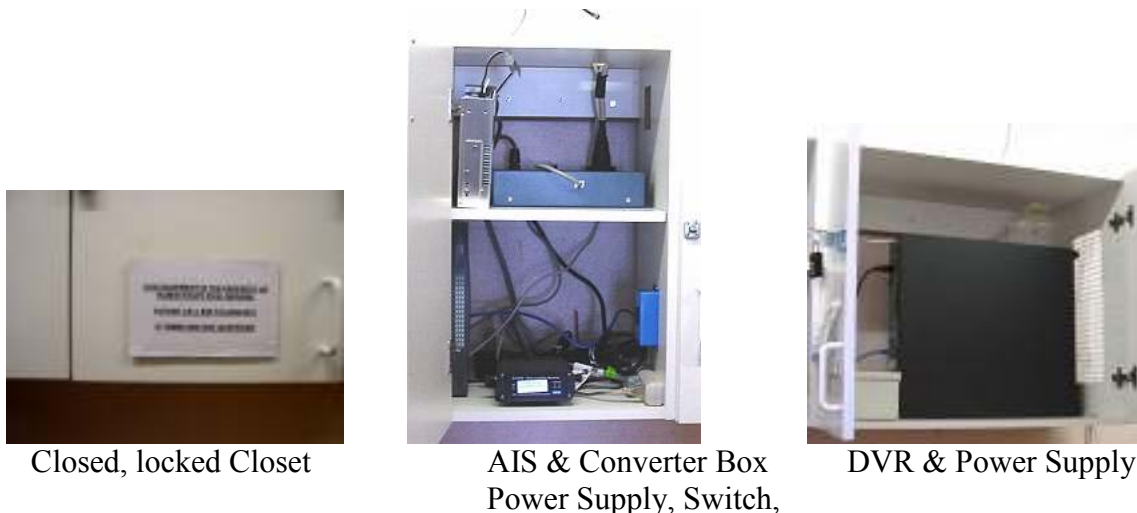


Figure 5 Device Closet in Room 510 at AAFEs Building

The combination for the locks on both cabinets is 431.

A “kill switch” has also been installed and is labeled on the outside of the cabinet to enable building facility staff to power down the camera and radar in the case of emergency or where rooftop maintenance necessitates shutting down of those devices.





External Wiring to Closet



Kill Switch

Figure 6 Device Closet External Wiring and Kill Switch

The H2S CIS software will integrate the output of the existing software applications designed and packaged with each sensor type and will not attempt to replicate the functionality of that existing software. H2S CIS will achieve this by allowing for the uploading of data and images from the sensors to the Command Center server and then fusing the data into display interfaces to the watch commander workstation located in the EOC.

6.2.1 AFE's Building Sensor Installation and Configuration

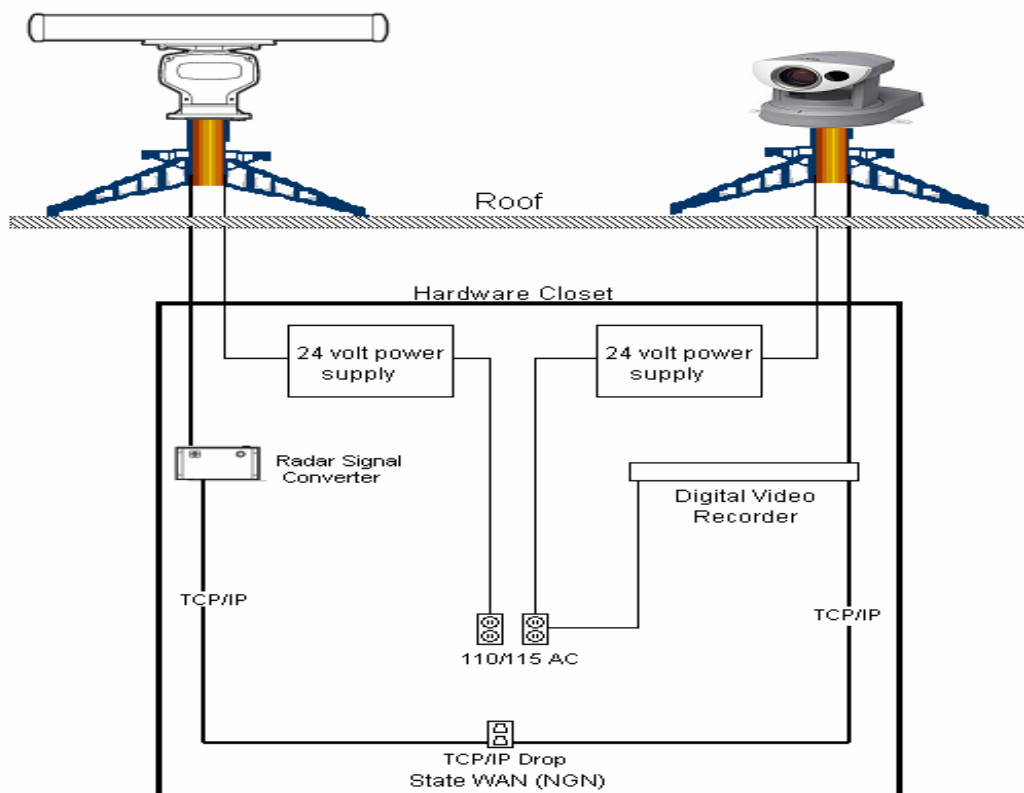


Figure 7 AFE's Building Sensor Configuration





Figure 8 AFE's Building Sensor Installation

6.2.2 Radar

The radar specified is a Nobeltec IR2-4.4 Open Array and will be mounted on a weighted tripod on the upper most roof of the AAFEs building with a clear view of the Kewalo Basin harbor entrance and distant view of the approach to Honolulu Harbor. It has a maximum scan range of 32 nautical miles. This digital radar was chosen based on reliability, size, cost and its ability to directly convert its output to a TCP/IP compatible format without the need for a third party converter.



Figure 9 Nobeltec Radar Installation



Nobeltec's Admiral software is the most powerful electronic charting solution available. It builds on the success of the Visual Navigation Suite™ by adding advanced features including Multi-Monitor support, comprehensive target tracking, GlassBridge™ Network support, vessel scaling and Vessel Management System software. Admiral also includes all of the standard features and supports all popular electronic chart formats, including the Passport World Charts, and the new Passport Deluxe. The charts for Region 40, Hawaii, will be included.

6.2.2.1 Radar Configuration

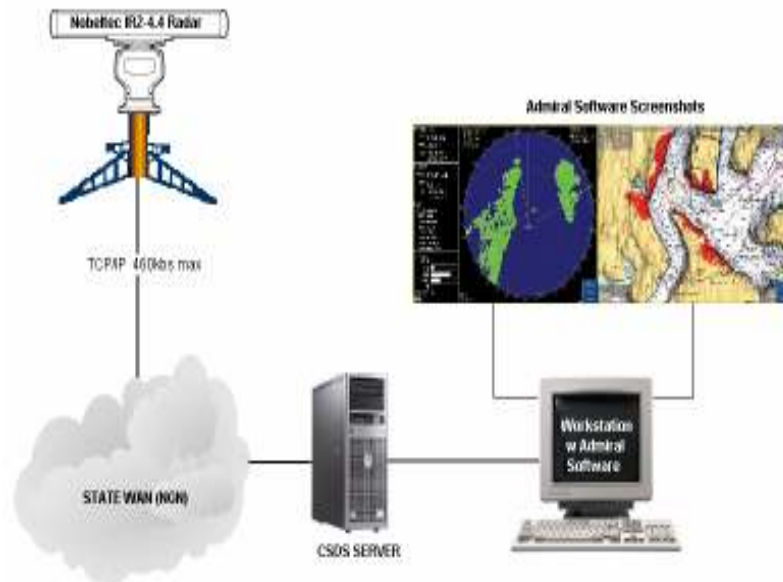


Figure 10 Radar Configuration

6.2.2.2 Radar Specifications

NOBELTEC IR2-4.4 4kw 4.5' Open Array Radar

Transceiver	54" open array
Rotation	24 RPM
Peak Power Output	4000 Watts
Transmitting Frequency	9410 +/- 30MHz
Beam Width	1.8° (Wide), 22° (Vertical)
Range Scales NM	1/8, 1/4, 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 12, 16, 24, 48
Resolution	Up to 1024 x 1024 pixels, 16 colors
Presentation Mode	Course Up, North Up, Leg Up or Heads Up
Bearing Accuracy	Better than 1%
Function	FTC, Interference Rejection, Target Expansion, Auto Calibrate, EBL, VRM, Zoom, Overlay, Gain, STC, Trails
Echo Trail Intervals	Continuous, 15, 30 sec., 1, 3, 6 min.
Guard Zone	Omni directional – fully user defined
Min Detectable Range	Better than 25 Meters at 1/8 NM range
Range Discrimination	Better than 25 Meters



Range Accuracy	Better than 8 Meters or .9% of max range of scale in use
Pulse Length	08 mSec/2000Hz (Short range) .25 mSec/1000Hz (Medium range) .8 mSec/500 (Long range)
IF Center Frequency	60 MHz
IF Band Width	15 MHz (20 MHz average) short and medium range, 5 MHz (3.0 MHz average) long range
Power Consumption	70 Watts or less
Voltage Supply	10.8 to 41.6 VDC
PC Interface	10/100 ethernet connection - Cat 5 or better
Cable Length Provided	2 Meters standard crossover ethernet. (Control box to PC.)
Operating Temperature	-13° to 131° F (-25° to 55° C)
Wind Force	100 knots relative
Water Resistance	IPX6 (IEC60945)
Transmission Speed	Up to 460 kbs
Output	Radar image video by proprietary protocol
Input	Radar control by proprietary protocol
Dimensions, Weight	4.5' W x 17.7" H, 49 lbs.



6.2.2.3 Nobeltec SLR-200 AIS Receiver

AIS Broadcasts That Nobeltec Software Recognizes

Nobeltec Admiral recognizes the AIS information types listed below. A Class A AIS unit broadcasts the following information every 2 to 10 seconds while underway, and every 3 minutes while at anchor at a power level of 12.5 watts.



Figure 11 AIS Installation

The information broadcast includes:

- Navigation status (as defined by the COLREGS - not only are “at anchor” and “under way using engine” currently defined, but “not under command” is also currently defined among others)
- Rate of turn - right or left, 0 to 720 degrees per minute (input from rate-of-turn indicator when present)
- Speed over ground - 1/10 knot resolution from 0 to 102 knots
- Longitude and Latitude - 1/10000 minute
- Course over ground - relative to true north to 1/10th degree
- True Heading - 0 to 359 degrees derived from gyro input
- Time stamp - The universal time to nearest second that this information was generated

In addition, the Class A AIS unit broadcasts the following information every 6 minutes:



-
- MMSI number - same unique identification used above, links the data above to described vessel
 - IMO number - unique identification reference (related to ship's construction)
 - Radio call sign - international call sign assigned to vessel, often used on voice radio
 - Name - Name of ship, 20 characters are provided
 - Type of ship/cargo - there is a table of possibilities that are available
 - Dimensions of ship - to nearest meter
 - Location on ship where reference point for position reports is located
 - Draught of ship - 1/10 meter to 25.5 meters [note "air-draught" is not provided] •
 - Destination - 20 characters are provided (at Master's discretion)
 - Estimated time of arrival at destination - month, day, hour, and minute in UTC (at Master's discretion)

Although there are two types of AIS classifications (A and B), Nobeltec's AIS receiver does not have a classification and does not transmit data, but is capable of receiving the data types listed above from Class A transmitters.

6.2.2.3.1.1 Nobeltec SLR-200 AIS Receiver Technical Specifications

SLR-200 is a compact dual channel synthesized VHF receiver designed to receive and decode transmissions from vessels fitted with Class A AIS transceivers.

- **Electrical**
Power supply range: 9 - 30 Volts DC
Power consumption: 400mW
- **Output**
Baud rate: 38400 Baud (38.4Kb) or 4800 (internal link)
Format: ITU/ NMEA 0183
Output message: VDM
- **Receiver**
Frequency: AIS 161.975 MHz to AIS 162.025 MHz
Channel spacing: 25KHz
Sensitivity: -112dBm
Demodulation: GMSK
Data Rate: 9600
Antenna Impedance: 50 ohms
- **Physical**
Dimensions: Length: 140mm, Width: 120mm, Height: 50mm and Weight: 600g
Mounting: Trunnion bracket
Connectors: Antenna BNC
Output port: 9 pin D socket
Power: 2-pole plug
- **Transmission Specifications**
Static information: Every 6 min, when data has been amended, or on request.
Dynamic information: This is dependent on speed and course alteration



6.2.2.4 Radar Hazardous Pattern at AFE's Building

These exposure limits are based on criteria quantified in terms of specific absorption rate (SAR). Both the ANSI/IEEE and NCRP exposure criteria are based on a determination that potentially harmful biological effects can occur at an SAR level of 4 W/kg as averaged over the whole-body. Appropriate safety factors have been incorporated to arrive at limits for both whole-body exposure (0.4 W/kg for "controlled" or "occupational" exposure and 0.08 W/kg for "uncontrolled" or "general population" exposure, respectively) and for partial-body (localized SAR), such as might occur in the head of the user of a hand-held cellular telephone. The new MPE limits are more conservative in some cases than the limits specified by ANSI in 1982. However, these more conservative limits do not arise from a fundamental change in the SAR threshold for harm, but from a precautionary desire to add an additional margin of safety for exposure of the public or exposure in "uncontrolled" environments.

Two radar warning signs will be posted on the radar mount with a phone number where individuals can call SCD for more information.

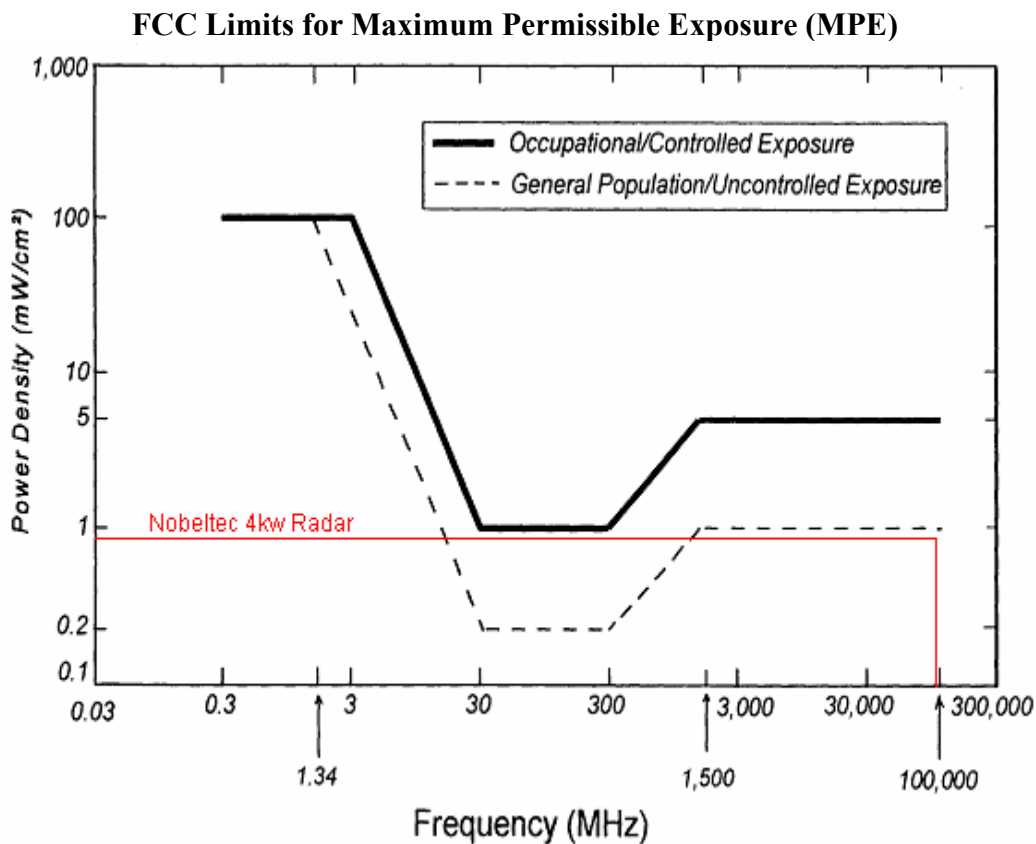


Figure 12 Radar Hazard Pattern at AFE's Building



6.2.3 Camera

The camera specified is a Pelco Spectra III and will be temporarily mounted via weighted tripod on the roof of the AFEs building with a clear view of the moorings and entrance to Kewalo Basin. The camera will capture images of foreign fishing vessel and crew activity. The camera was chosen based on performance, reliability, ruggedness and a large populated installation throughout Hawaii.



Figure 13 Camera Installation

6.2.3.1 Camera Configuration

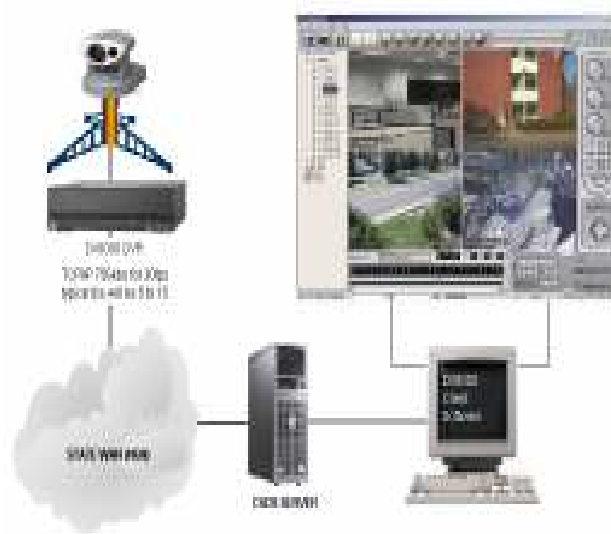


Figure 14 Camera Configuration



6.2.3.2 Camera Specifications

Pelco Spectra III SE Series Dome System Specifications

CAMERA/OPTIC

Color/Black-White (23X)
Signal Format
NTSC (DD53CBW)
PAL (DD53CBW-X)
Scanning System Progressive (2:1 Interlace output)
Image Sensor 1/4-inch CCD
Effective Pixels
NTSC 724 (H) X 494 (V)
PAL 724 (H) X 582 (V)
Horizontal Resolution
NTSC >470 TV Lines
PAL >470 TV Lines
Lens F1.6 (f = 3.6~82.8 mm optical)
Zoom 23X optical, 10X electronic
Zoom Speed (optical range) 2.9/4.2/5.8 seconds
Horizontal 54° at 3.6 mm wide zoom
Angle of view 2.5° at 82.8 mm telephoto zoom
Focus Automatic with manual override
Maximum Sensitivity @35 IRE
NTSC/EIA
0.08 lux at 1/2 sec (color)
0.3 lux at 1/60 sec shutter (B-W)
0.013 lux at 1/2 sec (B-W)
PAL/CCIR
0.08 lux at 1/1.5 sec (color)
0.3 lux at 1/50 sec shutter (B-W)
0.013 lux at 1/1.5 sec (B-W)
Sync System Internal/AC line lock, phase adjustable via remote control, V-Sync
White Balance Automatic with manual override

CAMERA/OPTIC (con't)

Shutter Speed Automatic (electronic iris)/Manual
NTSC 1/2 ~1/30,000
PAL 1/1.5 ~1/30,000
Iris Control Automatic Iris Control with manual override
Gain Control Automatic/OFF
Video Output 1 Vp-p, 75 ohms
Video Signal to Noise >50 dB
Wide Dynamic Range 80X

MECHANICAL

Pan Movement 360° continuous pan rotation
Vertical Tilt Unobstructed +2° to -92°
Manual Pan/Tilt Speeds
Pan 0.1°-80°/sec manual operation, 150°/sec Turbo
Tilt 0.1°-40°/sec manual operation
Preset Speeds
Pan 360°/sec
Tilt 200°/sec

ELECTRICAL

Input Voltage 18-30 VAC; 24 VAC nominal
Input Power 25 VA nominal (without heater), 70 VA nominal (with heater)
Fuse 1.25A
Auxiliary Outputs 2
Alarm Inputs



6.3 Mobile Meshed Wireless Network

In the event of a both natural disaster and terrorist incident, significant damage to communications and power infrastructure can be expected. There might also be damage to buildings and other physical structures. Mobile, meshed wireless devices can be placed throughout a given area, creating an instant, self-powered, wireless network. Throughout this system, sensors can be placed such as cameras for police surveillance and motion detectors to gauge building stability. In an ideal situation, every person would be equipped with devices providing for instant, real-time video, voice and data information necessary to establish order and choreograph search and rescue missions. Rescue workers can access the Internet or intranet for immediate information. Additionally, rapid deployment of data capabilities is of utmost importance as the command center turns up. Using VoIP phones and switches, wireless enables computing devices and the “office in a box” can be deployed in minutes to begin the business of managing the response and recovery.

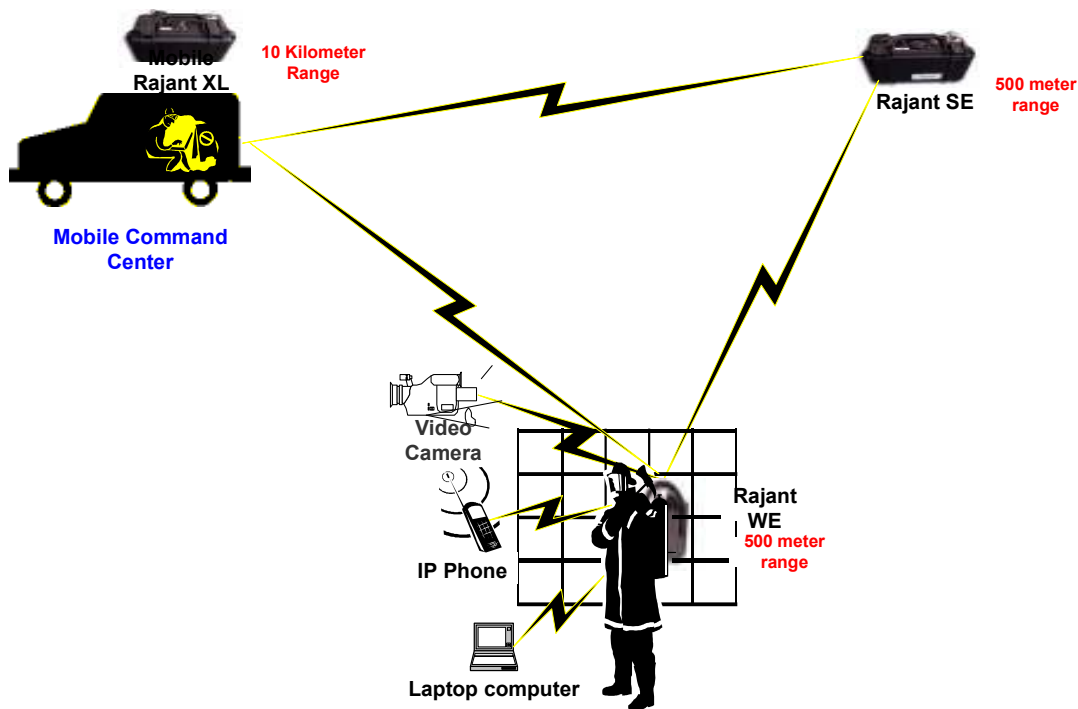


Figure 15 Mobile Meshed Wireless Network

This demonstration uses three meshed wireless devices, a VoIP phone, camera and laptop wirelessly connected to each other transmitting voice, image and data over the mobile meshed wireless network.



6.4 Critical Infrastructure Video Surveillance Feed

At the time of this document version the video images from a critical infrastructure surveillance system (Hawaii Electric Company) had not yet been implemented. The delay has been caused by the need for a communication link from HECO to a State Intranet portal and the cost involved on installing the link. SCD was able to obtain the funding and equipment to install the link and it is expected that this portion of the project will be completed by year end.

7 H2S CIS Advanced Concept Studies

The H2S CIS team will perform an advanced concept studies in the following areas:

- Advanced Sensors
- Mission Planning System
- Operator Collaboration Tools

The purpose of these studies will be to identify future sensor based technologies that could be incorporated into the H2S CIS; to identify requirements and capabilities for a mission planning system; and to develop and define operator collaboration and functional tools.



Appendix A: Security

In defining Security Groups for H2S CIS, there are three basic levels of system functional access available of which only one will be assigned to any particular group. The three basic levels are User, Operator, and Administrator.

The majority of logons for H2S CIS will fall under the category of "User". As such, any member of a Group that has been assigned "User" privileges will be able to access the software and view sensor data or archived files to which they have been given access.

Groups with "Operator" level privileges will inherit the same capabilities and restrictions as "User" groups but will also be able to control sensors, archive files and control how data is displayed within the display system of the EOC

"Administrator" Groups, naturally, have complete system access including the creation and deletion of user accounts, archiving of data, and controlling of sensors.

Appendix B: Connectivity

The sensors residing at the Public Safety Building (AAFES) are connected with following ip addresses and are accessed via the State Civil Defense sub-net of the NGN.

Radar control unit – 10.136.254.30
PTZ Camera - 10.136.254.31
AIS receiver - 10.136.254.32

